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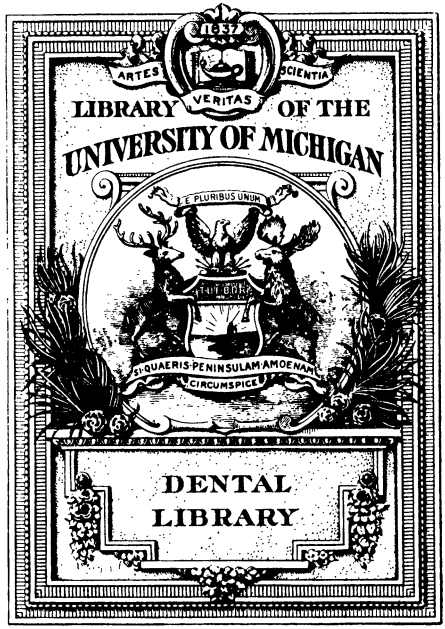
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AMERICAN DENTAL JOURNAL

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OUR POST GRADUATE COURSE

OPERATIVE DENTISTRY.

BY R. B. TULLER, D. D. S.

DISCUSSING SOME INCIDENTS OF OFFICE PRACTICE.

A dentist, as well as a doctor, is not long in practice before he meets with some exceedingly difficult problems for which he finds no diagnostic advice or remedy that seems to fit the case in text books, or that help him in any way. Among some of the first things of this kind which came to me in my early practice in a country town, may be worth relating, and discussing in the light of later understanding. On a very hot day in haying time, towards the close of the day, a farmer came in from a two mile ride on horse back, and desired extracted a first or second lower molar on the left side.

A very careful examination failed to disclose a cavity, or anything to explain why it should be giving excruciating pain. As patients are quite frequently mistaken as to the location of pain, I examined adjoining teeth, and finally every tooth in his head, with the result that I could find no flaw of any kind. My patient was not over 24 years of age, and I don't know that I ever saw, from all standpoints, a more perfect set of teeth. The arches were large and ideal. The occlusion was ideal, and every tooth was typically formed and sound.

Still this strong, healthy, robust man was suffering from an aching tooth that was driving him wild. He was impatient because I would not take his word as to which was the offending member, and remove it without delay. I explained and argued that the case was strange and unusual, and that he should not lose a sound tooth. He wanted an end to the pain at almost any sacrifice and he could, without hesitation or doubt, locate the tooth that was ailing. I suggested that relief might come from cutting around it and allowing the blood to flow. This treatment together with the application of phenol sodique did ease it; and, giving him some of the medi-

cine, I prevailed upon him to go home, suggesting that a night's rest might end it all. I told him that his heated condition due to hard-work and the hot sun had been the exciting cause; though I could not explain why, in what appeared to be perfectly normal tooth. I thought rest and quiet would restore peaceful conditions. He went out, mounted his horse and rode away.

In the meantime darkness had come on. My office was not equipped with a better light than a kerosene table lamp, for that was more than thirty years ago when lighting facilities were meager, especially in small towns. As the evening advanced I began to feel that my patient had found relief, but I was soon otherwise impressed; for a galloping horse came up to my door, and the rider hastily burst in upon me, and with more or less profanity demanded the extraction of that tooth instantly, or he'd go to my competitor.

Under such pressure, and feeling that I did not know what else to do, and yet doubtful in my mind as to whether extraction was going to prove a remedy (the tooth being sound I was sure) I, with his aid in holding the lamp, took out the one he indicated as offending.

The result was absolute relief the instant the tooth was out, and he was satisfied. An examination of the tooth verified my statement that no decay existed about it. The thought then came to examine the interior. I therefore split it open and found what to me then was an unheard of thing—or if heard of, was surely not impressed upon my brain—a calcified or ossified pulp. My spliting forceps had split it in half, but each half readily dropped out of the chamber like a nut meat from its shell; but showing a live portion of nerve attached, extending into each root. Incidentally I will say, that a few weeks later I extracted its mate on the other side of the jaw for like reasons, and found the same conditions.

Now, from present understanding, I feel quite confident that I could pretty well diagnose such a case, and proceed in a way to save the tooth. In diagnosing a puzzling case I would use both percussion, and the application of heat. In most cases when a tooth is violently aching like that, the irritation extends to the peridental membrane, and the tooth is more sensitive to touch than its neighbors. Tapping it with an instrument indicates that; and also that the patient is quite right as to the locality of pain though no cavity is found. But in this case soreness on touch seemed to be absent.

Application of a heated instrument, first in a very quick touch to the tooth, would show, if there was a quick sharp pain, that there was a sensitive pulp; and quick response would indicate little or no deposit of secondary dentine, unless, possibly, floating nodules imbedded in the pulp—not thickening the walls. If there is quick sharp response to the quick touch of heat, the pulp is usually normal. Still it may be in an irritated condition due to some injury to the peridental membrane, such as a blow in the tooth, or biting suddenly too hard on some hard thing in one's food; but then the tooth would be sore to touch as well. Anyway, we can pretty safely conclude the trouble is not of the neuralgic character, so often due to calcific deposit or secondary dentine, encroaching upon the nerves. If the tooth is sluggish to respond to heat, permitting a somewhat prolonged contact of the hot instrument before indication of any pain but finally producing it, we may count usually on a vital pulp; and may at least suspect some form of secondary dentine. A tooth with a dead pulp responds differently to continued heat if at all. There may be a deep-seated dull ache if the tooth is made too hot, even if the pulp is dead. An absolutely necrosed pulp will not respond painfully to quite a prolonged touch of a hot instrument, except as it may be sore to any sort of touch. Almost invariably there are other indications that go to help us determine a dead tooth. In either case, if dead or calcified pulp is causing pain, we want to get into the pulp chamber to remedy the trouble; and if there has been doubt before of the exact character of the trouble there will be none when the chamber is penetrated, so far as these two possible conditions are concerned. The odor of a dead pulp cannot be mistaken.

It is a strange thing that the deposit of secondary dentine begins and goes along for years with perhaps no disturbance at all, while steadily encroaching upon the nerve all the time; and, then, all at once, will start up the severest tooth ache, or will produce the reflex pain of severe neuralgia—more often the latter. It is the belief of many dentists that the secondary deposit of dentine within the pulp chamber of teeth, while making no demonstration in the teeth themselves, is more often the cause of persistent neuralgia or reflex pains, than any other one thing; though not infrequently precipitated into real disturbance by some other ailment or disturbance of the physical functions.

When once a diagnosis indicates a condition that warrants making an opening into the pulp chamber, the removal of pulp and the proper filling of the roots almost always results favorably in the way of relief from pain; though it almost always follows that calcic deposit of this kind is common to a number if not to all the teeth in the same mouth, to a greater or less degree.

And so it appears that more than one tooth may, in some instances, be the cause of neuralgic demonstrations, or other teeth may grow to be, after some particular tooth has been operated upon. Rarely, I believe, do these calcic deposits make such direct demonstrations of pain in the tooth itself, as in the case cited. Here were two teeth at least (and both, as I remember, first lower molars—mates) affected in the same way; but going along evidently for a number of years without any sign. It took the haying exercise and hot sun on this particular day to disturb the equanimity of the abnormal conditions that for long had been in gradual development. As I remember, no disturbance had occurred before. Who can say why?

These calcific deposits, following no understood rules, are truly obscure cases for the dentist to contend with, and difficult often to correctly diagnose. They not infrequently defy immediate conclusions, and lead to a number of separate inquiries with symptoms under observation for some time; and especially where the demonstrations of pain are reflex. A connection to the source may sometimes be traced after due observation; sometimes not. If several teeth are each contributing to the disturbance collectively or singly, or alternately, the case is more complicated to either locate or remedy.

To the practitioner who has given much thought, study and investigation to ills of this nature it is something of a marvel to observe how many of the common, though usually minor ills, such as neuralgia, headache, megrim aside from toothache may be conquered by proper and intelligent treatment of the teeth. It is well known that some of the most violent and persistent cases of neuralgia have been relieved by an intelligent dentist when the skill of medical men for long periods has failed.

(To be continued.)

BACTERIOLOGY AND PATHOLOGY.

BY GEO. W. COOK, B. S., D. D. S., CHICAGO, ILL.
DEAN OF DENTAL DEPARTMENT, UNIVERSITY OF ILLINOIS, PROFESSOR OF BACTERIOLOGY, UNIVERSITY OF ILLINOIS.

Q. WHAT ARE PROTEIDS?

A. Proteid is one or many of a group of non-crystallizable compounds and is rich in nitrogen. They are quite similar to each other and widely distributed in all vegetable and animal structure.

Q. WHAT PART DO THEY PLAY IN LIVING SUBSTANCE?

A. They are absolutely indispensable to all living substance that is known to exist on the face of the earth; quantitatively they constitute the principal part of the living cell.

Q. WHAT CHEMICAL ELEMENTS ARE FOUND IN THE PROTEID MOLECULE?

A. The basic elements consist of carbon, hydrogen, sulphur, nitrogen and oxygen.

Q. WHAT ELEMENT IS MOST CONSPICUOUS IN A PROTEID MOLECULE?

A. The element nitrogen distinguishes proteids from the carbohydrates and fats; therefore they are called nitrogenous bodies.

Q. HAS THE PROTEID MOLECULE AND ITS MOLECULAR CONSTITUENTS BEEN MADE OUT?

A. They have not. The best analysis that has ever been made is the one by Preyer, who analyzed the haemoglobin of the blood. He found, as nearly as possible, that it consisted of carbon 600, hydrogen 960, nitrogen 154, iron 1, sulphur 3, and oxygen 179. Other analyses show some variation from the above chemical formula, depending upon the source from which the compounds are taken.

Q. WILL PROTEIDS OSMOSE THROUGH ANIMAL MEMBRANE?

A. They will not. The molecule must become broken up in order that it may be utilized as a nutritive substance. The peculiar characteristics of proteids are that they are a complexed chemical compound, crystallizable and non-diffusible.

Q. GIVE A CHEMICAL TEST FOR PROTEIDS.

A. They give a yellow color when boiled with nitric acid, and when ammonia is added to this solution the color is changed to an orange.

Q. WHAT IS UNDERSTOOD BY BIURET TEST?

A. A solution of proteids made alkaline by caustic potash or soda. A drop of copper sulphate added to this solution gives a clear violet color.

Q. WHAT IS UNDERSTOOD BY THE POTASSIUM FERROCYANIDE TEST?

A. By adding a few drops of acetic acid to a solution of proteid, and then with the addition of a few drops of potassium ferrocyanide, a white cloudy appearance will manifest itself.

Q. WHAT THREE MOST IMPORTANT PROTEID COMPOUNDS ARE DETERMINED BY THESE TESTS?

A. Albumins, globulins and the vitalline. These are considered the three simplest proteid compounds.

Q. WHAT ARE THE MOST COMMON ALBUMINS AND WHERE FOUND?

A. They are the albumins that are found in the white of hens' eggs, serum albumin found in blood serum, and muscle albumin found in the muscular tissue. The albumin from these three sources are proteids that are soluble in pure water. Plant albumin is soluble in the plant juice and can be detected by the above test.

Q. WHAT ARE SOME OF THE CHARACTERISTICS OF GLOBULIN ALBUMIN?

A. Globulin is insoluble in water, but is made soluble on the addition of small quantities of salt. If globulin is placed in a saturated salt solution the globulin is precipitated into a floculent mass. The phenomenon is termed the salting out of globulin. This peculiar characteristic of globulin albumin has been found to exist in the albumin of muscles, of blood serum, of fibrin, and a number of other proteid bodies.

Q. WHAT ARE SOME OF THE END PRODUCTS OF PROTEID DECOMPOSITION?

A. Carbonic acid, lactic and oxalic acids, and in some instances sulphuric acid. Cholestrins are also regarded as the end product of

proteid decomposition. Carbonic acid is the essential end product of cell decomposition and is found to be present in all instances.

Q. WHAT IS A CARBOHYDRATE?

A. As a chemical compound it has no nitrogen and the chemical molecule is made up of carbon, hydrogen and oxygen.

Q. IN WHAT RATIO DOES THESE THREE ELEMENTS STAND IN THEIR ATOMIC GROUPING TO EACH OTHER?

A. The carbon atom within the molecule is always six or a multiple of six. The hydrogen atoms are always double the number of atoms of oxygen in a molecule of water.

Q. WHAT PART DOES THE CARBOHYDRATES PLAY IN LIVING SUBSTANCE?

A. The carbohydrates are of great importance in the functional activity of all living substance and play an important role in the manufacture of energy in plant life.

Q. CAN CARBOHYDRATES ALWAYS BE DEMONSTRATED IN ALL LIVING SUBSTANCE?

A. As yet they have not been isolated in every instance, and yet their chemical relations are far more simple in their molecular composition than that of proteids.

Q. INTO WHAT THREE GROUPS OR COMPOUNDS ARE THE CARBOHYDRATES USUALLY DIVIDED?

A. They are usually divided into monosaccharides, disaccharides ond polysaccharides. The two last compounds are anhydrides from the first group; however, this does not hold good in all instances.

Q. GIVE THE CHEMICAL FORMULA FOR A MONOSACCHARIDE.

A. The chemical formula of monosaccharide in all instances is usually made up of $C_6\ H_{12}\ O_6$, therefore they are sometimes called isomeric. Grape sugar, dextrose, glucose, and fruit sugar all belong to the monosaccharides.

Q. WHAT IS THE MOST IMPORTANT CHARACTERISTIC OF MONOSACCHARIDES FROM A CHEMICAL POINT OF VIEW?

A. They have the peculiarity of absorbing oxygen from their surroundings and in this way reduce bodies that are rich in oxygen.

Q. FROM WHAT SOURCE MAY THE DISACCHARIDES HAVE THEIR ORIGIN?

A. Disaccharides arise from the combination of two molecules of the monosaccharides, with a loss of one molecule of water (anhydride), thus we have C_{12} H_{22} O_{11} + H_2O. The more common disaccharides are the cane sugars (saccharose), and milk sugar (lactose).

Q. HOW CAN DISACCHARIDES BE CONVERTED INTO MONOSACCHARIDE?

A. By boiling disaccharides with an inorganic acid or by the action of certain forms of bacteria, these disaccharides undergo a hydrolytic cleavage, as it is called, in which case they pass back into a monosaccharide. This change is called inversion.

Q. CAN DISACCHARIDES BE IMMEDIATELY FERMENTED?

A. They can by the action of the lactic acid bacillus when they are broken down immediately into their end products, which is lactic acid and carbonic acid.

Q. HOW WOULD YOU MAKE A TEST FOR POLYSACCHARIDES?

A. By the addition of a solution of iodine, ordinary starch is colored an intense blue. Glycogen, which is also a polysaccharide, on the addition of iodine gives a mahogany brown. The ordinary cellulose is not affected by the iodine alone, but on the addition of sulphuric acid the cellulose gives an intense blue.

Q. IN WHAT COMBINATION ARE THE CARBOHYDRATES USUALLY FOUND IN LIVING SUBSTANCE?

A. They are found in combination with proteids.

G. GIVE AN EXAMPLE OF A SUBSTANCE IN WHICH THE PROTEIDS AND CARBOHYDRATES ARE CHEMICALLY COMBINED IN THE SAME COMPOUND.

A. In mucin and mucoid-like substances they are combined, and mucin will give the reaction of both proteid and carbohydrate.

Q. WHERE ARE THE FATS FOUND?

A. Fats are very much like the carbohydrates, they are widely spread in the animal cells, and in combination with proteids, carbohydrates somewhat in the same manner, however, their combination exists in living substance similar to that of carbohydrates. They are non-nitrogenous substances and have the chemical elements of carbohydrates, which are carbon, hydrogen, and oxygen. But their chemi-

cal arrangements in the molecule differ considerable from that of carbohydrate. They are sometimes called ether or esther compounds.

Q. GIVE AN EXAMPLE OF AN ESTHER.

A. An esther compound is one in which an acid is combined with alcohol, with the loss of water. Glycerin illustrates this as well as any of the so-called esther compounds. They are sometimes designated as fatty acids.

Q. GIVE THE GENERAL FORMULA OF FATS.

A. $C_3\ H_5\ (OH)_3 + {}_3Cn\ H_2n\ O_2 - {}_3H_2O$.

Q. NAME SOME OF THE FATTY ACIDS.

A. Palmitic, stearic, butyric, valeric, capronic. These are the general fatty acids.

Q. WHAT PART DOES OLEIC ACID PLAY IN THE GENERAL FATTY ACID SERIES?

A. Oleic acid does not appear in the general acid series, but it appears in the various oils combined with glycerin.

Q. WHAT CHANGES TAKE PLACE IN NEUTRAL FATS?

A. By certain chemical manipulation fats are split up by hydrolysis into glycerin and free fatty acids, a change that is produced by the digestive process by all cell life for the maintenance of fats for nutrition.

Q. WHAT OTHER COMPOUNDS ARE NECESSARY FOR CARRYING ON THE LIFE PROCESSES OF LIVING SUBSTANCE BESIDES THE PROTEIDS, CARBOHYDRATES AND FATS?

A. The essentials for the maintenance of physiological function are water, inorganic salts and gases.

Q. WHAT IMPORTANT CHARACTERISTICS HAS WATER IN THE LIVING SUBSTANCE?

A. Water is an important compound in living protoplasm and gives to all living substance its liquid appearance, and it assists in the shifting of the elements and compounds in their physiological processes; in other words, it is the vehicle in which all function is performed.

Q. WHAT ARE SOME OF THE IMPORTANCES OF THE INORGANIC SALTS?

A. The inorganic salts occur in all living substance dissolved

in water, keeping up a continuous disassociation and recombining with the various elements. It is through this activity that many scientists have attempted to explain the vitalistic hypothesis of life.

Q. NAME SOME OF THE MOST IMPORTANT ELEMENTS PRESENT IN LIVING SUBSTANCE THAT WE RECOGNIZE UNDER THE HEAD AS SALT.

A. Sodium chloride, potassium chloride, ammonium chloride, calcium carbonate, sulphates and phosphates. Chlorine apparently is one of the very important essentials in the life process to both animal and plant.

Q. WHAT IMPORTANT LESSON HAVE WE TO LEARN BY THE ANALYSIS OF LIVING SUBSTANCE?

A. We have learned that bacteria are classed among the living substances and belong to the vegetable kingdom, and whether studied in their natural habitat or in artificial culture media they are governed by the same law that constitutes life in general. And when studying bacteria from artificial culture media it must be borne in mind that this is not their natural habitat, and consequently it is quite impossible to know all their functional processes.

Q. WHAT IS UNDERSTOOD BY PURE CULTURES OF BACTERIA?

A. Pure culture of bacteria is a method whereby the bacteria are separated one from the other, and you have a single species to cultivate and inoculate, free from contamination of others or similar forms of life.

Q. WHAT IS UNDERSTOOD BY THE ARTIFICIAL CULTIVATION OF BACTERIA?

A. Artificial cultivation of bacteria is a process of preparing food media for bacteria and placing it where bacteria can grow free and independent of the surroundings of other forms of life.

Q. WHAT CONSTITUTES THE ESSENTIAL ELEMENTS FOR ARTIFICIAL FOOD?

A. It must be composed of proteids, carbohydrates and fats, inorganic salts and water.

Q. WHAT ORGANIC SUBSTANCE WILL COME THE NEAREST TO FULFILLING THIS REQUIREMENT?

A. Chop fine five hundred grams (500 grams) of lean meat, add 1000 c.c. of distilled water, let this stand in a refrigerator twenty-

four hours, strain out the meat, neutralize, add a half of 1% of sodium chloride, 1% of meat peptones; heat in sterilizer until all of the albumin is coagulated; filter through filter paper; test reaction and sterilize three successive days.

Q. WHY SHOULD THE MEAT BE FREED FROM FAT AND CHOPPED FINE?

A. There is a sufficient amount of fat left in the lean meat, and the particles of meat are so divided that the essential part of the meat will be drawn out by the water.

Q. WHY ADD THE SODIUM CHLORIDE?

A. The reasons for adding the common salt is that there was not a sufficient amount of salt taken from the meat to supply the required amount for bacterial growth.

Q. WHY ADD MEAT PEPTONES?

A. To render the meat extract more digestible for the bacteria.

Q. WHY NEUTRALIZE?

A. Because the meat extract is acid and that all living substance must have neutral or almost neutral compounds in order that they may break them up and assimilate them.

Q. WHY FILTER THIS MATERIAL?

A. It should be filtered in order that all solid or undigestible substances may be removed from the solution.

Q. WHY STERILIZE THREE DAYS IN SUCCESSION?

A. In order that all substances may be properly sterilized. The first day the growing of vegetative forms of bacteria may be destroyed; by the second day the spores that were not destroyed on the first day will have developed, and the second sterilization will destroy this new crop of organisms; and the third sterilization is to accomplish the same effect as the second.

Q. WHY CAN WE NOT STERILIZE SUFFICIENTLY THE FIRST DAY TO DESTROY BACTERIA AND THEIR SPORES?

A. For the simple reason that in order to destroy spores it would be necessary to raise the temperature and maintain this temperature sufficiently high and long enough to destroy some of the valuable ingredients in the culture media.

Q. WHAT IS ANOTHER EFFICIENT CULTURE MEDIA FOR BACTERIA?

A. Potatoes which are scrubbed with soap and water, thoroughly rinsed in running water, the eyes and dark spots on the surface of the potatoes cut out and these immersed in a 1-1000 mercuric chloride solution for from ten to fifteen minutes. The potatoes may be sliced in sufficient thickness as to lay in a petri-dish, placed in a steam sterilizer and sterilized three days in succession, when they will be cooked sufficiently that bacteria may easily take from them sufficient nutrition for the maintenance of the species.

Q. WHAT OTHER SUBSTANCES MAY BE USED FOR BACTERIA FOOD MEDIA?

A. Bread and potatoes are sometimes used, because they contain sufficient elements for bacterial growth.

Q. WHAT IS UNDERSTOOD BY A SOLID CULTURE MEDIA?

A. A solid culture media is one that is made liquid by raising the temperature sufficiently high as to liquefy the substance and will become solid at room or incubator temperature.

Q. WHAT IS CONSIDERED INCUBATING TEMPERATURE?

A. It is a temperature about that of the animal body, especially that of a man.

Q. WHAT IS THE BODY TEMPERATURE OF MAN?

A. About 98 Fahrenheit or 37 C.

Our Foreign Department

THOMAS L. LARSENEUR, D. D. S., Foreign Department Editor

TREATMENT OF NEURALGIAS OF THE FIFTH PAIR WITH LOCAL INJECTIONS OF ALCOHOL.'*

BY DR. P. VANEL, DEMENSTRATEUR A L'ECOLE DENTAIRE DE PARIS.

Neuralgias of the trigeminus nerve are of a special interest to us dentists, for several reasons; in fact, their siege is located in the region where we perform our dental operations and duties. These cases of neuralgias are often caused by the teeth, and it is a disease which we frequently meet with in our daily practice.

A thorough examination should precede the treatment in order to discover and locate the cause of neuralgia.

If the pain is but a symptom, the therapeutic is reduced to the treatment of the causal lesion, ophthalmia, dacryostenosis, sinuous, otitis, dental caries, tumors; most generally, in these cases, neuralgia will disappear with the cure of the determining cause of the affection. If on the contrary, the neuralgia is of a general cause, such as a diathesis condition, it is through a special internal treatment that relief of pain will be obtained and cure effected.

Naturally we may and must use the symptomatic treatment, to which I will draw your attention presently. It contains narcotics and anodynes, revulsion, electrification.

In rebele cases, in those cases where no definite cause can be found, in those special cases of facial neuralgia, it is upon the nerve itself that the treatment should be given, either on its origin the ganglion of Gasser. To attain this end we have many ways at hand. On one hand we have the section, resection, extirpation, which are of the domain of surgery, and which are not easily performed on the trigeminus. On the other hand we have anesthetic injections of fluids; these injections may be superficial or deeply seated, which

*L'Odontologie, Paris, January 30, 1909.

will constitute, as I term, minor surgery of the fifth cranial pair of nerves.

Solutions of cocain in injections, *loco dolenti,* have sometimes given good results in the hands of Pitres and Verger, de Malherbe, de Lagrave.

Others have used chloroform, ether and alcohol. Neuber and Frank went so far as to use an aqueous solution of 1 per cent of osmic acid in injection.

Schoesser of Munich was the first one who used alcohol at 80°. This method was afterwards extensively preconised and used in France by Otswald, Levy and Beaudoin, Bissand and Sicard.

This treatment of trigeminal neuralgia by means of alcoholic injections 80° is a rather recent method, the technique of which is somewhat simple and having marvelous results worthy of attention.

At that point of view the trigeminus nerve may be reached from several parts: From its origin; its trunk, *i. e.,* level with the Gasserian ganglion; round foramen and oval foramen; at the level of the diploe of the superior and inferior maxillary bones; at the inferior dental canal; at the angles of Sphix; at the posterior palatine canal; finally at the suborbital, infraorbital and mental foramens.

According to the different parts we wish to reach, the operation will somewhat differ in its technique, which will become more or less difficult, and having a greater or less importance, and in some cases with a serious prognostic.

Among all the methods the following seems to me the most advisable, as it offers great many advantages and has never yet caused any immediate accidents nor after-effects if the operator has strictly followed the rules of asepsia. This method consists in reaching the nerve at the level of its peripheral emergence, at the suborbital, infraorbital and mental foramens. This method in fact is very simple; it may not cure all cases of facial neuralgia, but it will cure many of those well defined cases of facial neuralgia which will be of great assistance to us and which we should not overlook.

The technique of this treatment of simple, attention, care and skill are required. If these are carefully followed the operation will be found to be a minor one in comparison with the results obtained.

It is not so with the other methods used to get access to the trigeminal nerve, and very few of us would dare to perform it through the Gasserian ganglion.

MODUS FACIENDI.

For this purpose our hypodermic syringe may be used, as we do not require more than one to two cubic centimeters of fluid. A fine needle about eight-tenths of a millimeter and at least four millimeters in length. Absolute alcohol, 80°, free of impurities, is required.

The parts to be operated on should be previously washed with soap, tepid water and ether. It is also advisable to anesthetize the region to be operated on with a solution of cocain or stovain, 1/100 before the injection is made.

At the suborbital canal, we are dealing with the suborbital nerve, a branch of the ophthalmic nerve. The configuration of this region may be easily obtained by palpation; if there is a canal (foramen) the needle should be inserted obliquely downward and slightly outward; and if there is a notch the injection should be made in the direction of the orbital vault. In this operation the only thing to fear is the eye, which should be protected by the end of the forefinger, allowing the needle to slide alongside of it.

At the infraorbital canal we have the infraorbital nerve, branch of the superior maxillary nerve; its orifice is easily found. One should take care not to introduce the needle more than one centimeter, in order not to penetrate into the antrum or in the orbital cavity.

At the mental foramen we have the ramy of the inferior maxillary nerve; there the injection is more easy, as there is no fear of causing any lesion on any important organ.

The injection may be considered successful, inasmuch as there is anesthesia in the part of the nerve branch injected; the relief or the cure may not be permanent and the period of relief may vary according to cases; sometimes the first injection will effect a cure and sometimes several injections are necessary to obtain the desired results.

Generally this operation gives rise to no complications, although we may sometimes meet with some accidents.

The injection of alcohol 80° in the tissues and around the nerve is not very painful if the needle is injected at the right place and if the plunger of the syringe is pressed slowly and gently. If there is pain it is slight and of a short duration, a few days.

We quite often meet with oedema after the injection, and it may be very well marked, but this has no disastrous effect and I must add that this oedema disappears without leaving any traces or mark.

UNCLEANLINESS OF THE ORAL CAVITY AND DENTAL CARIES.

BY DR. CH. L. QUINCEROT.

(*Le Monde Dentaire,* Paris, Jan. 1909.)

Etiologically, an unclean condition of the oral cavity is the principal factor in the production of dental caries. While admitting that a certain number of predisposing factors, such as sex, age, constitution, heredity, and defects in structure, aggravate the production of caries, the author maintains that in the majority of cases uncleanliness is the initial cause.

Uncleanliness means the presence of any mucous deposit of more or less creamy consistency, covering or lining the oral cavity and its organs. Its presence is noted in various degrees in man, woman and child (in the last more frequently than is generally supposed), not only in times of apparently good health, but specially in delicate patients, in dyspeptics, in chlorits, cachectics, in hepetism, arthritis, glycosuria, etc., and especially in certain pyrexial conditions.

Gestation and lactation specially predispose women, in whom, without any other apparent symptoms more or less excessive ptyalism, this condition may become chronic, which explains the bad condition of the teeth in pregnant women despite their claiming to take great care of their teeth. Besides their teeth are more vulnerable because of the calcium salts required for their nutrition being partly diverted to the foetus, and owing to the quantities of lactic acid in the saliva which carries these salts.

Dry mouths are immune to caries, while mouths with abundant saliva, especially if the latter is viscous, no matter whether alkaline or acid, with a tendency to forming creamy deposits, will surely exhibit signs of caries sooner or later. For independently of the corrosive effects which the acid saliva may have on the dental tissues, it aids fermentation by its adherence to the teeth, and offers the microorganisms a brooding place where each can exercise its specific action.

Knowing the detrimental effects of oral unclealiness, the indifference of physicians to the oral hygiene of patients is surprising for instead of doubling their vigilance, patients are often allowed to entirely neglect the hygiene of their mouths. Prophylaxis of dental

caries by proper advice to the mother and by subsequent care of the child is likewise a physicians duty, for by a properly regulated diet and reasonable hygiene, generation after generation could be made more and more immune.

In sick persons who show symptoms of dental caries, the mouth should be refreshed in order to keep the temperature down, and clean off mucous deposits by means of detergent mouth-washes. These washes should be slightly alkaline, the gingivae should be massaged several times a day in order to remove the exudations or to at least eliminate the deposits which tend to lodge in the gingival edge. A soft brush should be passed over the dental arches, tooth-paste being preferable to powder, because it can be more easily introduced into the inter-dental spaces.

Elastic bands and floss silk dipped into some slightly alkaline solution should be insisted on, and the interstices between the teeth should be scoured several times a day in order to avoid any stagnation. Dentifrices with boreate of soda basis have a salutary effect on the gingivo-dental tissues; the atonic gingavae must be stimulated and cautery applied to hypertrophied points. If in addition to these apparently complicated, but in reality very simple measures, in the case of a pregnant woman, some pinches of calcium phosphate are added to the diet (although very little of this is assimilated by the digestion, yet this form is preferable to any dose of a medicinal dilution, which generally contains hydrochloric acid,) and later on to that of the child during the period of dentition, the statistics of dental caries should be successfully reduced.

EXPERIENCE IN CASTING UNDER PRESSURE.

BY DR. J. SOLBRIG.

(*Le Laboratoire et le Progrès Dentaire Rénuis,* Paris, January 24, 1909).

Before the American Dental Club of Paris, Dr Solbrig demonstrated some new points in his technique of casting which tend to do away with the latest imperfections inherent to this process.

The most difficult piece to cast is doubtless a well-fitting plate, the

gold having a tendency to not fill perfectly all the spaces left by the wax. The obstacle which prevents the gold from flowing in all the minute spaces is formed by the air that is not displaced from the fissures in the investment. These annoying fissures can be avoided by selecting a proper investment material, and oiling the inner surface of the flask before casting. As for the sprue-hole, a single canal of 1½ mm. diameter will meet all requirements. The flask must be heated to a lively red heat, in order to retain the metal at fusing point long enough to fill the spaces before cooling. In order to allow the air and gases formed by the burning of the wax and the decomposition of the investment material to escape, vents are cut near the sprue-hole. To entirely avoid the formation of gases by the tubrning ore of the wax, the method of a double investment was resorted to, as described below, allowing a mechanical removal of the wax.

Another important question is the contraction of the investment during the process of heating. After the mechanical removal of the wax, the author dries out the flask until no traces of steam is left, and the gold is poured into the cooled flask. This method, however, is only applicable to small pieces, since the gold solidifies too quickly to fill an extensive mould. At any rate, the presence of air in the heated mould, and the necessity of securing an easy outlet for the gases during the pouring of the cast, was demonstrated beyond doubt.

On the other hand, it is impossible to find for these vents a position which would guarantee absolute success. To avoid this difficulty an investment material of coarse grain is used, which on account of its porosity allows the escape of the gases through the mass of the investment.

Since, on the other hand, the investment would impart undue roughness to the plate, a thin coat of a finer investment is first applied to the wax model, the whole technique of the casting being as follows:

The wax is prepared as usual, care being taken to obtain as smooth a surface as possible. The smoother the surface of the wax, the smoother that of the cast plate. Still better results are obtained if, instead of smoothing the wax, its surface is painted by a fine and soft brush with a little talcum powder or whiting. The sprue is placed as usual.

A quantity of finely grained investment material is prepared

and applied with a brush on the free side of the wax. This cover of fine investment should have a uniform thickness of from 1 to 2 mm. Before that investment has had time to thoroughly dry, a second layer of coarse investment material is applied over the first one.

This second layer is made sufficiently thick to enable the operator to remove the wax model without distorting it. After the layer of coarse investment is hardened, the whole is removed from the model, and again finely-grained investment material is painted over the reverse side of the wax with a fine brush, so that the entire wax model is covered with a layer of finely-grained investment of very moderate thickness (from 1 to 2 mm.).

Before the second layer of fine investment is entirely dry, it is covered with another layer of coarse investment, after the free end of the sprue is introduced into the crucible-former and sprue holder which has been previously oiled, the flask is put in place. The subsequent *modus operandi* as usual. The castings thus obtained yield the best results imaginable.

Moreover, this new investment does not undergo any shrinkage, even under the high temperature required for successful casting. The castings fit absolutely and perfectly on the model like rubber plates.

The use of 22k. gold for gold inlays, in majority of cases is preferable to 24k. gold. Inlays which are cast with 22k. gold have a greater resisting power, their shape is less liable to be distorted, and are more durable.

This crystallization may be overcome by immediate hardening of the metal. This may be attained either by reducing the amount of metal by use of hollow inlays, or by casting in cool moulds, as above mentioned.

TO POLISH NCKELED INSTRUMENTS.

Submerge them for twelve hours in a saturated solution of tin chloride in distilled water. Then dry the instruments and rub them with a soft cloth or chamois leather.—*La Odontologia.*

ELECTRIC NARCOSIS AND RESUSCITATION.

(*The Dental Surgeon*, London, July 24, 1909.)

Some time since we had occasion to refer to the condition known as "electric narcosis," first discovered by Professor Leduc, of Nantes.

It is brought about by passing through the nerve centers a current, preferably from a battery, which by means of a special commutator was interrupted 100 times a second, the current actually flowing for one-tenth of the period between each interruption. This is now known as the Leduc current; and if there is no sign of its displacing ether and chloroform for producing anesthesia in human beings, it certainly has done so to a large extent in the conduct of laboratory experiments upon animals.

We have received copies of a series of papers by Dr. Louise G. Robinovitch, of New York, in which she makes several important communications regarding the uses and properties of such currents.

Speaking of electric anesthesia in laboratory work, she points out the following advantages among others: (1) The blood pressure, respiration, and temperature remain about normal, even after eight hours or longer anesthesia. (2) It can be induced not only centrally but locally. (3) No animals have been lost from this anesthesia. (4) A voltage of from 5 to 10 volts is all that is required to produce electric anesthesia, and this potential is quite free from danger to life. Finally, Dr. Robinovitch has been able to perform several important operations, such as exposure of the brains, carotid artery, vagus nerve, and abdominal organs, under its influence.

Carrying her investigations further, she has made the somewhat paradoxical discovery, that if properly applied, this current can resuscitate electrocuted animals. The animal having had the hair shaved off at three places—head, upper part of dorsal region, and lower part of the spine—is placed in the cradle with an electrode fastened to each area. The electrode placed at the lower part of the spine is the anode, the other two are cathodes, that at the root of the neck at first being disconnected.

When every thing has been prepared, a lethal current is passed through the body until apparent death sets in. The cranial electrode is then disconnected, that at the root of the spine being joined up in

its place, and the operator by means of a suitable break carries on rhythmical excitations with a sufficient potential to cause maximum respiratory expansions. These are practiced for one second with an interval of from two to three seconds. From ten to thirty of these are generally necessary to restore spontaneous respiration, and a successful result may occur after a much longer period.

Carrying her work still further, Dr. Robinovitch has succeeded in resuscitating animals after cardiac or respiratory syncope has been induced by chloroform or ether, the method of applying the current, as well as the current itself, being essentially the same as that we have described.

The possible practical importance of these experiments in surgery is obvious, for there would seem to be no valid reason why, in cases where the administration of a general anesthetic was attended with some anxiety, arrangements should not be made to apply rythmical electrical excitations.—*Lancet.*

DISINFECTION OF TOOTH-BRUSHES.

(*Deutsche Zahnarztliche Wochenschrift.*)

The discouraging results of dental and oral hygiene in many cases are doubtless due to a neglect of the disinfection of the tooth-brush. Boiling being unpractical, an antiseptic solution which involves no danger for the teeth or the oral cavity, may be applied. Alcohol is most recommendable; it may be used with any kind of brush except a celluloid brush, and need not be washed off before applying the brush in the mouth.

After using, the brush is thoroughly rinsed and put back into the alcohol. If the bristles of new brush show a tendency to become hard, the alcohol is diluted with one-third water for some time, which does not seriously impair its disinfecting powers. Vessels especially constructed for the disinfection of tooth-brushes will facilitate the public with this hygienic precaution. A glass or a porcelain bottle, with a hollow, dome-shape glass top, into which the end of the tooth-brush protrudes, or any wide neck bottle, in which the brush is hung by a string, may be used. Both contrivances preserving the strength of the alcohol, and allowing of a ready handling of the brush.—*The Dental Surgeon.*

NEGLECTED TOOTH CAUSES DEATH.

(*The British Journal of Dental Science,* London, August 2, 1909.)

An inquest was held at Marylebone on the body of Lawrence Marshall, a professor of law at Iowa City University, who arrived in England June 29th, on a tour.

Mr. Marshall, it appeared, complained of toothache before landing at Liverpool, and when he reached London on July 4th, saw a physician about his teeth.

Dr. A. S. Morley of Gower St. said that Mr. Marshall had a very bad abscess extending from the right side of the face down to the neck, caused by a defective wisdom tooth. The witness operated on the abscess, and on Monday advised him to have the tooth removed. This was done by Dr. F. Morley, dental surgeon of Wimpole St., under an anesthetic, which the patient took surprisingly well. On Wednesday, the swelling had increased, and Mr. Marshall consented to have a second tooth removed, which he had objected to previously, together with the wisdom tooth. For this purpose, he was removed to a nursing home in Weymouth St., W., and was given an anesthetic similar to that used on the previous occasion. He died in a few minutes from asphyxia, due to the swollen throat, and septic poisoning, as well as to the anesthetic.

Dr. F. W. Spurgeon, who made a post-mortem examination, said that Mr. Marshall was a fine strong man, 6 feet 2 inches in height and probably weighing eighteen stone.

The verdict was death from misadventure.

ORIGINAL CONTRIBUTIONS

TOOTHSOME TOPICS.

BY R. B. TULLER.

I've been down this summer to visit my old boyhood home, and, incidently my old boyhood friend David Harum.

Dave and I were boys together, though he was a little older than I.

We hadn't met for over 30 or 40 years when I greeted him, he gave me a quizical look for a moment, and then grabbing my hand exclaimed, "Gol ding, if aint Tol Ruller! I knowed y'u as quick as I seed y'u; but jest couldn't spit out the name. How be y'u, anyway? Gosh-all-fiddle-sticks, but I'm glad to see y'u!

"Where did y'u come frum, Chicago? Say, I was thar onct when it wasn't but jest a little bit of a huddle of a town. Dad went out to see if he didn't want to settle in Illinoy; but it didn't look better'n Swamp to us an' so we come back. Guess if we'd staid we'd been pooty rich.

"How many inhabitants y'u got now?—nigh on to a million I possume? Mor'n two millon? Gosh-a-mighty! jest think! Growed some sence I wuz thar.

"Well, you hev come back to see the ole swimmin' hole I spect? Haw, haw. We've growed some too, an' the ole swimmin' hole is in the limit where y'u can't swim now 'thout close on an' I wouldn't give a durn fer it.

"Say, Tol,—(I allus think of you as Tol. We uster call you Tol Ruller, an' you fellers allus called me Harum-Scarum; an' I guess you wuz 'bout right)—do you 'member, Tol, that spankin' you got one day when we boys wuz a swimmin' an' divin'? I'll never fergit it 'long's I live. It wuzn't one yer dad give y'u; howsumever; but one you got onexpected—'member? You wuz a teterin' on a long slippery plank we had stuck in the bank fer a spring-board, an' you wuz goin' harder an' harder, when fust you knowed yer fect slipt off an' the end of

the plank flew up suddent, an' caught y'u slap! where y'u wasn't lookin' fer it, an' tost y'u 'bout 20 foot in the air, turned y'u over 'bout three times an' you landed in the water on the flat of yer back. Wow! Gosh! but you did git a slap. Kinder knoct the wind outen y'u so's you didn't wanter swim no more that day. Haw, haw, haw, ahum, ahum, Gosh!

"I ain't so durned sure you didn't git paddled some when you got home, haw haw, ahum. Good times them days, anyway, ef we did git a lickin' onct in a while.

"'Member that time, Tol, when we went to 'coon' some watermelons off ole deacon Tollket?—an' he set his ole Towser on us?—an' when Tows got up to us we jest turned in an' sicked him on to something on beyond, an' he went tearin' on into a bunch of currant bushes where an ole turkey hen wuz a hatchin' out some aigs, an' come out with her by the neck, so proud of his stunt. Twas kinder moonlight, an' while the old deacon went a-chasin' the dog to try an' save the turkey, we got away with the best watermelon in the patch, an' a couple of mush-melons—'member?

"Ho, ho, haw, haw, haw, ah-hum, ah-hum, hum. Wasn't the ole man mad! An' then he cuse Hank Richards an' Sim Brown, ho, ho, haw, haw—ah huh, ahuh, ahuh. Say, but I guess we were pootty nigh devilish, huh?

"An' say, Tol, ther' wuz anuther feller we uster pester a lot too, —ole 'Dudenbiddy' Howson who kept the 'chickery' an' we had him settin' up nights with a loaded gun to keep them chickings an' aigs frum bein' stole. We didn't want none of his chickings an' aigs, but gosh-a-mighty, we made him think someboddy did.

"'Member the ole dummy we fixt up on a line so's we could pull it across the hen yard? Oh, ho, ho, ho, we got Julie Baker—she wouldn't squeal, not her—to go to the front door an' buy two aigs while we sneaked in the dummy and strung the line. Ole 'Dudenbiddy' had his ole-shotgun loaded with peas, 'member? You got one side of the hen yard an' me t'other, an' then, after pokin' the hens in the henhouse through a knot hole with a stick, an' makin' 'em squak, we pulled the dummy back an' forth 'crost the chicking yard when the ole man came out with his gun. Never will fergit that! haw, haw, hu, oh huh.

"The ole gun had been loaded 'bout ten year, an' when she went

off, over went ole 'Dudenbiddy' half way to the back door. Oh, gosh how we did laff! oh, ho, ho, ho, ho, ho, ho, ah huh, ah huh. 'Course it wuz time fer us to drop the dummy, an' when the ole man come to, an' peered into the chicking yard in the dark an' saw that thing layin' there he thought he sure had killed a man, fer he couldn't git no word out of him—stone dead.

"Say, wasn't that a time when the hull house went to bellerin' an' old Duden run fer Doc Allen, who wuz also coroner too, an' they got out half the town to go down an' investigate;—your dad an' mine both along. So wuz we. As innercent as angels—but kinder scart some too, 'cause we didn't count on things goin' quite so fur, an' ole Dudenbiddy an' his fambly goin' nigh crazy an' takin' on, thinkin' he had killed a man.

"'Member how poor ole Dude went up to deppity sheriff Bosely an' held out his hans an' cried, 'Oh, Lord, I done it! I done it. He wuz a stealin' my chickings; but I didn't mean to kill him. I on'y had peas in the gun, an' didn't think they'd kill nobody. Oh, Lor, ef I ever git outen this, I wont never kill nobody agin,—never, fer all the chickings in the world; an' they're wo'th three shillin's a piece, everyone on 'em. Oh, Lor!

"An' then that danged important deppity sayin' 'Well, Mr. Howson, I'm sorry to do it of course, but if you own up to the killin' I guess I'll have to slip on the irens.' An, b'gosh, ther he wuz a leadin' around that ole man so scart he couldn't a run no how. Bosely couldn't miss a chanct to show he wuz a officer of the law.

"Gosh-a-mighty, I wuz kinder glad when they found the dummy —an' Tol, they wuzn't a sign a pea had ever hit it, haw, haw, haw, ho, ho, uh huh, uh huh.

"Then, Tol, we begun to git kinder scary and worrit some, when they begin to try to find out whose ole close the dummy had on; an' dad's ole coat come nigh givin' me away,—on'y dad, lookin' at me sharp enough to see clear through me in the lantern light, said, yes, it did look like one of his old ones—but, he guessed it wasn't, fer this coat wuz all sweat yaller under the arms an' his'n wuzn't. I felt some easier when he said that. But say, when he got me alone in the barn afterward, an' jest said, 'David ef you ever git inter any sich a muss agin, I'll jest reckernize the coat an' let the law take its course on ye, you young rascal. I otter give ye a hoss

whippin' right now. Yer a itchin' fer it. You otter had them han' cuffs on sted of that harmless old hen farmer. You'd a lookt purty wouldn't ye? y'u young ape! I'm ashamed to be yer father. Haw, haw, haw,—one on dad at that. Haw, haw, ho, ho, hoo, hoo, uh huh, uh huh.

"Well, sir, Tol, Chicago didn't look good to me when I wuz there, an' I come back to the hills an' I ben here pooty nigh ever sence; cept that summer I druv tow hosses on the canal, an' went down to New York. B'gosh, they tell me Chicago is pooty nigh as big as New York. If I'd a staid out west I might a ben a millionaire now.

Say, a feller writ a book 'bout me a few years ago, an' got rich on it; but he didn't never whack up with me. D'd you ever read it? Well, I don't think none on 'em can git the best ov me in a hos trade yit. But a hull lot of that book haint true, an' old Jedge Lowny reckoned I could sue fer damages; but I haint never done it.

"Well, Tol, I'm glad I seen y'u. It is good fer sore eyes. So long. See ye again mebbe. Come in the bank whenever y'r wanter write a letter. Make it yer headquarters whilst here."

SWAGED ALUMINUM PLATES

H. W. ALLWINE, D. D. S., OMAHA, NEB.

The dental profession has long felt that it is not doing for the public the best that it can do in the making of rubber dentures. It has held to this practice because the rubber plate can be made so easily and quickly. It is made, too, because it can be produced at less cost than a plate can be made of any other material, especially metal. This lowering of price and saving of time are what have popularized the rubber plate. I believe that most dentists, at least, would discard the rubber plate if they had a quick method of manipulating metal, —a method by which they can make, say an aluminum plate, as quickly as a rubber plate. By the method and with the machine that I use, I can do this. I say that a swaged aluminum plate can be made as quickly as a rubber plate can be made, and with no more expense to the dentist. Others, to whom I have explained the method and are using the same machine that I am using, testify to doing the same thing, and some declare they would prefer to make the aluminum plate, by this method, to one of rubber.

Periodically the dental profession goes a little "off" on new methods. Just now it is the cast craze. We all admit the value of the cast machine in our practice. In its place, we feel that we could not get along without it. It has its place—a valuable place. An aluminum plate can be cast very nicely with it. Some enthusiasts even try to make themselves and others believe that the cast plate is destined to supplant the rubber plate. This it will not do. The long time required to make a cast plate will of necessity keep the price beyond the popular demand. Dentists everywhere realize this fact. I mean all dentists who are working for people of moderate means. While the ordinary plaster cast is being made, the plate can be swaged as done by the method here suggested. For this reason I say the dentist, at this stage of the game, must look to the swaged aluminum plate for a supplanter of rubber.

I am enthusiastic over the swaged aluminum plate because it supplies the want and need. It responds to the want of the dentist and the need of the patient. It is thin, strong, and easy of manipulation. It permits the normal thermal changes, hence prevents the

absorbtion of the tissues caused by the rubber plate. It can be made as quickly as the rubber plate with no more expense than the rubber plate. The price can be brought within the means of most of our patients. For these reasons I think aluminum should supplant rubber as a baseplate.

As was said, an aluminum plate can be made as quickly as rubber plate can be made. It requires five minutes to run a metal cast. In ten minutes more the plate can be swaged. Thus fifteen minutes thereafter the plaster impression is taken, the plate can be swaged ready to be used as a baseplate, and the "bite" can be taken upon it. To the practical man this latter is a valuable feature. While the common plaster cast is hardening, the plate can be swaged by this method. I frequently swage the plate and take the bite before the patient leaves the chair. Is not this method, answering these requirements, worthy the attention of the prosthetic men of the profession?

The following is the method of procedure in swaging an aluminum plate. Take a plaster impression. Around the sides and front of the impression flow some thin plaster. Now place the impression, while the plaster is soft, against a flat metal surface, leaving about three-sixteenths of an inch between the metal surface and the paletal surface. Thoroughly close the sides. This leaves the posterior part of the impression open, into which the metal can be poured. When hurried, the metal can be melting while the impression is being placed as above described. Pour the metal immediately, having it just at the fusing point. Do not wait for the plaster to dry. As soon as the shrinkage of the metal has taken place, indicated by the depressions at the top of the metal, cool the cast in water. Now place a blank on the cast and press lightly, in the swager, to get an approximate swaging. Take it out and trim as desired. At this time place tea lead for relief as required by the conditions of the case, The relief should extend to nearly the top of the ridge. More should be placed where hard places are noticed. Now place the plate onto the cast, put both into the swager and give the plate a final swaging.

I never anneal aluminum. For small upper plates, use twenty guage. For larger upper plates and lowers, I use eighteen guage. Never spring a plate off the cast after final swaging. Melt the metal out.

As I am much interested in swaged metal work, I will be pleased to answer any inquiries, if postage be inclosed for reply.

MEETINGS

THE OHIO STATE DENTAL BOARD.

The Ohio State Dental Board will hold its regular fall meeting for the examination of applicants for license, on October 19-22, 1909. All applications, with the fee of $25.00, should be in the hands of the secretary not later than Oct. 9th.

For further information and blank applications address,

F. R. CHAPMAN, Sec'y,
305 Schultz Bldg., Columbus, O.

ILLINOIS STATE BOARD.

The annual meeting of the Illinois State Board of Dental Examiners for the examination of applicants for a license to practice Dentistry in the State of Illinois will be held in Chicago at the Dental Department of the University of Illinois, cor. Honore and Harrison sts., beginning Monday, November 8th, 1909 at 9 a. m. Applicants must possess the following requirements in order to be eligible to take the examination.

The following preliminary qualifications shall be required of candidates to entitle them to examination by this Board for a license to practice dentistry in the State of Illinois: Graduates of a reputable dental or medical school or college, or dental department of a reputable university who enter the school or college as freshmen on or after the school year of 1906-7, must have a minimum preliminary education of not less than graduation from an accredited high school or a certificate from the State Superintendent of Public Instruction, equivalent officer or deputy, acting within his proper or legal jurisdiction, showing that the applicant had an education equal to that obtained in an accredited high school; which certificate shall be accepted in lieu of a high school diploma.

Candidates will be furnished with proper blanks and such other information as is necessary on application to the secretary. All applications must be filed with the secretary five days prior to date of examination. The examination fee is twenty $20.00) dollars with an addition fee of five ($5.00) dollars for a license.

Address all communications to T. A. Broadbent, Secy., 705 Venetian Bldg.

ABSTRACTS AND SELECTIONS.

THE LOCAL ANESTHETICS RECOMMENDED AS SUBSTITUTES FOR COCAINE.*

BY C. N. LE BROCQ, B. A., M. D.

(*From the Pharmacological Laboratory, Cambridge.*)

(*The Dental Record,* London, Aug., 1909.)

The substances which have been investigated are: Stovaine, Novocaine, Tropacocaine, Bet-Eucaine, Aylpin, Beta-Eucaine lactate, Nirvanine, Holocaine hydrochloride, Aconine, Orthroform (new), Anæsthetine.

The points to which especial attention have been paid are those laid down by Professor Braum as essential in esteeming a local anesthetic action. They are:

1. A lower degree of toxicity than cocaine in proportion to its local anesthetic power.

2. Sufficient solubility in water. The solutions should be stable, that is, they should keep without deterioration and be capable of sterilization by boiling.

3. Absence of any sign of irritation. There should be no injury to the tissues; the local anesthetic should be easily absorbed without causing any after-effects, such as hyperæmia, inflammation, or necrosis.

4. Compatibility with adrenalin.

5. Rapid penetration of the mucous membrane, and suitability for medullary anesthesia.

The only exception I would make to these postulates of Braum, is that dealing with absorption. It is not obvious that easy absorption is desirable. If the drug is absorbed slowly, it remains longer in contact with the nerve fibrils, and produces a more prolonged action. It has been stated that by delaying absorption, as by local vasoconstruction we are giving the anesthetic a longer time for action, and it is for this reason that adrenalin is injected with these substances.

*Report of the Therapeutic Committee of the British Medical Association, reprinted from the *British Medical Journal.*

If a drug can be obtained which contains and fulfills the above conditions it can be safely said it will supersede cocaine.

To arrive at a satisfactory conclusion it is necessary to deal with each drug separately, and to discover how closely each approaches the conditions specified by Braum.

SOLUBILITY IN WATER.

Solubility in water is essential for subcutaneous and intraspinal injections. If a drug is not soluble in water to the extent of forming a 2 per cent solution, I have regarded it as unworthy of competing with cocaine. By examining the solubility of these drugs, the list is considerably diminished, for acoine, holocaine hydrochloride, anaesthesine, orthoform (new), beta-eucaine, are all more or less insoluble, and for this reason alone unsuitable for producing local anesthesia by injection. Beta-eucaine is not completely soluble in cold water to the extent of forming a 2 per cent solution, but if the solution is warmed, a 2 per cent solution is readily obtained. As dusting powders, these drugs many, of course, still prove useful, but I am not here concerned with that point.

Cocaine, stovaine, tropacocaine, beta-eucaine lactate-aylpin, and nervanine are freely soluble in water; their solutions are stable, and as a 2 per cent solution they will keep for a short time without deterioration.

STERILIZATION OF SOLUTIONS.

Cocaine cannot be boiled, decomposition occurs, and the drug loses its activity and is gradually destroyed. Stovaine, novocaine, beta-eucaine, lactate, tropacocaine, aylpin, nervanine can be sterilized at 115°C. if necessary, undergo no change, and the drug is as active after as before sterilization.

LOCAL ANESTHETIC PROPERTIES.

The determination of the local anesthetic action is not easy, as it is not practicable to work with accuracy on the lower animals on account of the difficulty in determining when sensation is absent or merely blunted. The method I adopted was to take cocaine as the standard, and to compare each drug with it separately.

By numerous experiments on frogs, rabbits, and human beings which will be described in detail elsewhere, I arrived at the following

conclusions: Stovaine has a more powerful anesthetic action, weight for weight, than any of the other local anesthetics. Aylpin, beta-eucaine lactate, novocaine, and tropacocaine have anesthetic properties about equal to cocaine. Nirvanine as a local anesthetic is inferior to cocaine.

TOXICITY.

Having determined the relative anesthetic action, it remained to estimate the toxicity of the drugs. The method employed was to find the minimal lethal dose—the smallest dose which will kill the animal—in frogs, mice, and rabbits.

All the drugs produce death by paralyzing the central nervous system in mammals and the heart in frogs. When the toxic dose of a drug is injected into a frog, movements gradually cease; the animal soon lies still in any position in which it is placed, and becomes to all external appearances dead; respiration ceases, and there is no response to any sort of stimulus. If the dose has not been large enough to paralyze the heart, it continues to beat, and as soon as the effects of the drug on the nervous system pass off the frog recovers. The explanation of the recovery is, of course, that a frog can exist for a considerable time, even for many hours, without respiration. Thus in obtaining the minimal lethal dose in frogs it is necessary to give these drugs in doses, which not only paralyze the nervous system, but which are large enough to paralyze the heart also.

Therefore, the minimal lethal dose in frogs represents the action of the drug on the heart, and in mammals its action on the central nervous system.

TOXICITY IN FROGS.

The minimal lethal dose for a 20-gramme frog, using a 2 per cent solution, is for:

	Minims.
Aylpin (most toxic)	6
Cocaine	12
Stovaine	15
Nirvanine	17
Beta-eucaine lactate	20
Tropacocaine	20
Novocaine	40
Novocaine (least toxic)	40

TOXICITY IN MICE.

The minimal lethal dose for a 20-gramme mouse using a 2 per cent solution, is for:

	Minims.
Aylpin	4
Cocaine	5
Nirvanine	7
Stovaine	8
Novocaine	10
Tropacocaine	10
Beta-eucaine lactate	12

TOXICITY IN RABBITTS.

The minimal lethal dose for a rabbit weighing 1,000 grammes, using a 10 per cent solution, is for:

Aylpin	between 18 and 23 minims
Cocaine	between 24 and 30 minims
Stovaine	between 25 and 45 minims
Tropacocaine	between 44 and 54 minims
Novocaine	between 53 and 63 minims
Beta-eucaine lactate	between 65 and 75 minims

As the toxic action of these drugs is to paralyze the nervous system, and also the respiratory center, the toxicity in animals must be regarded as the correct reading, for when respiration ceases the animal dies.

If the toxicity of cocaine be represented as 1, then:

The toxicity of aylpin	will represent 1.25
The toxicity of cocaine	will represent 1.0
The toxicity of Nirvanine	will represent 0.714
The toxicity of Stovaine	will represent 0.625
The toxicity of Novocaine	will represent 0.490
The toxicity of Tropacocaine	will represent 0.500
The toxicity of Beta-eucaine lactate	will represent 0.414

CONCLUSIONS FROM THE ABOVE.

Aylpin has anesthetic powers equal to cocaine, but it has a higher toxicity, and so does not comply with the conditions enunciated by Braum. Nirvanine has not the anesthetic power of cocaine, and is not only slightly less toxic. As however, we have four drugs equal to

or stronger than cocaine in anesthetic power, and considerably less toxic than nirvanine, no further experiments with this drug were deemed necessary.

From this it will be seen that only four drugs, namely, stovaine, novocaine, tropacocaine and beta-eucaine lactate have complied with the first two conditions. With these four drugs further experiments were performed to discover how they fulfill the other conditions laid down for the "perfect local anesthetic."

IRRITANT ACTION ON THE TISSUES.

Very little is known on the action of the local anesthetic on the tissues with which they come in contact. This effect is, however, extremely important, for it has been stated that gangrene and sloughing of the tissues have followed the use of certain of these drugs. It is well recognized, however, that they are all general protoplasmic poisons, that whilst having a special predilaction for nervous structures they depress and ultimately destroy every form of living tissue.

In these, as in previous experiments, cocaine was taken as the standard. Cocaine is generally recognized as having a slight irritant action of the tissues, and occasionally, after instillation into the eye, produces considerable conjuctivitis.

For these experiments rabbits weighing about one kilogram were used. The abdomen was shaved and the skin washed and made aseptic, after which ten minims of a 10 per cent. solution of the drug was injected subcutaneously. The drug was carefully sterilized, and all antiseptic precautions were observed.

After injection the part was kept under immediate observation for several hours, and then inspected daily for one week more.

Cocaine caused slight swelling and hyperaemia soon after the injection. The part completely recovered.

Stovaine caused intense hyperaemia and dilatation of the blood vessels, following by sloughing of the part.

Beta-eucaine lactate caused swelling and thickening about the seat of infection, followed by sloughing.

Tropacocaine caused swelling and some thickening, followed by sloughing.

Novocaine showed no swelling and no hyperaemia. The part was perfectly normal after injection, and remained so.

In the above experiments, where sloughing and necrosis occurs there were no signs of pus formation.

It is seen that a comparative investigation into the action of these drugs on the general tissue is of the utmost importance, for most of them possess a decided irritant effect; so much so, that they would produce sloughing and necrosis of the tissues with which they come in contact.

A 10 per cent solution is a stronger solution than is generally used therapeutically, yet this strength is still employed; moreover, ten minims of a 10 per cent solution roughly represents one grain, a quantity which is far exceeded when weaker solutions are injected. And even if it be injected, it is not fair to infer from a 10 per cent solution what will occur in a strength of one per cent. or two per cent., yet the present experiments still show the relative irritant action of these drugs. A drug which is only mildly irritant as a one per cent. solution, will presumably be the more irritant as a two per cent. solution, until, as the strength is increased, a stage is reached when destruction of the tissues and necrosis is obtained.

The irritant action of stovaine, beta-eucaine lactate, and tropacocaine is far greater than that of cocaine; novocaine is the only drug which is superior to cocaine in this respect.

COMPATIBILITY WITH ADRENALIN.

All the local anesthetics are compatible with adrenalin if the solutions are fresh and kept only for a short time. After a day or two the adrenalin decomposes unless it is kept in stoppered opaque bottles.

CONCLUSIONS.

In determining which of these four drugs is the most suitable substitute for cocaine, it is necessary to compare them with one another.

If novocaine and tropacocaine be first compared, their toxicity and anesthetic properties are, roughly, equal; but the irritant action of tropacocaine is far greater than that of novocaine; in the other respect their actions are similar; therefore novocaine is a more suitable drug than tropacocaine.

On comparing novocaine with beta-eucaine lactate it is seen that while the anesthetic value is roughly about equqal, the toxicity

of beta-eucaine lactate slightly less than that of novocaine, but the irritant action of beta-eucaine lactate is far greater than that of novocaine. It appears then, that while beta-eucaine lactate has only a slighter degree of toxicity to it in preference to novocaine, its irritant action far and away overshadows any such slight advantage, and novocaine is recognized as undoubtedly the better drug of the two.

Finally, it only remains to compare novocaine with stovaine. The former drug is less toxic and much less irritant; indeed, its specific action on the nerve fibers is so great that it has practically no destructive effect on the other tissues; stovaine is more toxic and considerably more irritant.

The one definite advantage which stovaine possesses over all the other local anesthetics is its great injurious action on the nerve fibers, as shown by anesthesia. Nevertheless, the specific action of stovaine on the nerve fibers is less than that of novocaine, since stovaine destroys other tissues besides nerve fibers. If stovaine and nocovaine be given in doses so that their anesthetic action is the same, both the the irritant and the toxic effect of the former drug, even in the smaller dose in which it is administered, are greater than the relatively larger doses of the latter.

I come to the conclusion therefore, that of the drugs which have been investigated, novocaine is most satisfactory for general use. Its anesthetic action is equal to that of cocaine, and its toxicity and general destructive power on the tissues are very much less.—*Pharmaceutical Journal.*

GOLD AS A FILLING MATERIAL, WITH SPECIAL REFERENCE TO PLASTIC GOLD.*

BY C. G. MORSHEIMER, D. D. S., ROCHESTER, N. Y.

Gold, At. Wt. 195.7. fusing pt. 1199. Centegrade. Gold is one of the few metals found in the metallic state, and probably one of the first known to men. Allusions to it are frequent in the old Testament, and jewelry and vessels found in Egyptian tombs afford evidence of the perfection attained in working it at a period earlier than the government of Joseph. There are many evidences that processes of

*Read before Rochester Dental Society.

alloying, refining and separating gold were practiced at a very early period of the world's history. According to Pliny, the matallurgy of gold was known in his day. Vitruvius also gives a detailed account of the method of recovering gold by amalgamation from cloth into which it had been woven. It was employed in Rome for the purpose of fixing artificial teeth more than three hundred years before the Christian era, and a law of the "twelve tables" makes exception with regard to such gold, permitting it to be buried with the dead. The great beauty of color and lustre and the power of resisting oxidation which gold possesses have caused it to be valued from the earliest ages for the purpose of adornment and as a circulating medium.

There are several kinds of gold used for the filling of the teeth, each one having its place where different conditions exist. Non-cohesive or soft gold should be used in cavities having four walls with a flat base. In preparing these cavities I use a round or rose bur at first and shape the cavity with the inverted cone bur. This kind of gold can be manipulated much faster than cohesive gold, as larger pieces may be used. It seals the cavity tighter and can be burnished easier to the walls. Union does not take place between the particles of gold introduced into the cavity; they are simply made to adhere mechanically by wedging the mats against each other into the cavity properly prepared to retain them.

Cohesive gold is employed largely for building up contour and approximal fillings. With this gold the particles cohere and the filling is a homogeneous mass; each piece is welded upon the other with the hand or automatic mallet; the cavity is prepared with grooves and undercuts for starting and retaining the filling.

Another method of filling the teeth with gold is by means of the cast inlay made of pure or 22k. gold; it is an ideal one, if in the hands of a competent operator. The cavity should be prepared so that the wax inlay can be removed without changing its shape, and still be self retentive. The advantages are that it can be done without the use of the rubber dam, and long tedious operations of hours at a sitting are eliminated. The frail walls of the cavity are cut back so the stress is brought more direct up on the gold, thereby protecting the cavity walls. This method I have used over one year without any failure that I know of.

The crystal gold, including "Watts" is cohesive and must be

treated as such. It is prepared by passing an electric current of feeble intensity through a solution of chloride of gold (which is pure gold dissolved in Aqua Regia) in which a plate of pure gold forming the anode is suspended and a platinum plate forming the cathode. The solution is decomposed and the gold is deposited on the platinum plate in the form of crystals, which vary in size according to the strength of the solution and intensity of the current. As the solution loses gold by deposition of the metal, it is replenished from the suspended gold plate, which is gradually dissolved. The crystals thus formed are generally pure; they are collected, washed and dried, and the product is ready for use. A crystallized form of gold is also obtained when an amalgam of gold is slowly heated until the whole of the mercury is expelled. When, however, a light spongy mass is required, the amalgam is first treated with nitric acid to dissolve out the excess of mercury. The crystals thus obtained are then heated to expel the remaining mercury, a method that leaves the gold "spongy" as mentioned and with a bright lustrous appearance. As I understand it, "Moss Fibre" gold is prepared by this method.

In the making of sponge gold, metallic gold may be precipitated from a solution of gold chloride in the form of fine powder, in scales in a more or less crystallized state, or in a spongy condition, according to the nature of the precipitating agent employed the strength of the solution, and mode to be pursued in manipulating it. When sulphurous acid is used as a precipitant, the gold is in the form of a brown powder, which is scaly. When oxalic acid is used the precipitate is of several forms. Ferrous sulphate is similarly used. The "plastic golds" most used are "Keton Williams," "Watts' Crystal" and "Moss Fibre."

Keton Williams gold should be thoroughly annealed on a mica tray. The filling is very easy to start with this gold, and can be made in much less time than with any other. I always fill the base and larger portion of the cavity with it and finish with Watts' crystal, which requires but little annealing and gives a much better finish. These golds that are broken up chemically are divided into smaller particles than the foil gold, therefore I think one can get a better condensed and a more homogenous filling.—*Register.*

HISTORY AND ETIOLOGY OF DENTAL CARIES.*

BY ROBERT R. GILLIS, D. D. S.

Under the history of dental caries we find that there never has been a race of men that has been immune from dental caries. The tombs of ancient Egypt show from the mummies unearthed that dental caries was known to them. The condition of the jaws and alveolar process in these mummies indicates that not only dental caries, but its sequence, alveolar abscess, was quite prevalent; and that the ancients suffered as we suffer can not be doubted.

Vincenzo Guerini, of Madrid, has recently published a very exhaustive history of dentistry. In this he makes reference to many of the ancients, who were probably practitioners of dentistry. In one article I was able to get hold of, which appeared in *Cosmos* a few months back, he makes mention of the more modern of the ancients as appearing about 450 to 600 years B. C.

The Etruscans probably were most apt in the art of dentistry. We find that about 450 B. C. the Table of Laws of the Romans includes, in one paragraph, a reference to something in dentistry. This particular paragraph or law was concerning the burial of dead bodies. The law prohibited the burial of any dead body with any gold attached to it, but it made exception of gold wires in the mouth, which supported false teeth. So we suppose from this that the Romans of that date knew something of the practice of bridge work or crown work. A little later, then, coming up to the time of Christ, historians of the day, and also the novelists now, those who wrote the best works of that time, spoke every once in a while of something along the line of false teeth. Particularly one or two of the writers spoke of some of their leading characters as wearing false teeth.

One speaks of "her teeth being as white as pearls, but they are not her own"; another that the "teeth were like gown, she takes it off at night." When the Romans overcame the Etruscans the Etruscans who were practicing dentistry went to Rome and were the leaders in the dental art from that time on. Dr. Guerini, in examining articles in one of the museums of Rome, was handed one exhibit which was

*Read before the Northern Indiana Dental Society, at Fort Wayne, September 8-9, 1908.

not publicly known because its identity had not been fully established. Upon close examination he found that it was two plates of gold soldered together with a wire ligature, and this had undoubtedly been a retaining appliance for some false teeth. We note that dentistry and medicine were not closely allied professions in those ancient times. There are several medical writers of that time who say nothing about dental practice.

Now, as to the etiology of caries; it has been defined as the chemical disintegration of tooth elements. In that it is a chemical action we imply that it is a molecular action; and that is in exact accord with the recent theories.

In the paper just read (Dr. Salisbury's) the places of beginning and its progress were discussed, so I will not repeat that here.

Caries may be quite white and it may be quite black, and it may be any intermediate color, due to different processes. A little later I will speak of that part of the question. I could not think of any better way to discuss the different theories as to the cause of caries than to arrange them in order as they have been presented from time to time for the adoption of the profession. Beginning about 1754-56, Boudet advanced the theory of inflammation. He and many of the writers following considered that caries began inside the tooth. Some inflammation was begun which lowered the vital resistance in the tooth, and decomposition resulted from this the same as it would if some irritant were applied to a bone, producing ostetitis and necrosis. In 1778 John Hunter wrote a treatise on caries in which he elaborated upon the inflammatory theory, and although he accepts that theory still he does it rather reluctantly. Here we have just a beginning of the breaking away from the inflammatory theory.

In 1806 another writer puts forth the belief that the inflammation originates within the pulp, within the soft tissues, and then spreads through the more solid portions to the surface.

In 1829 another writer comes just one step nearer to the real cause by declaring that the inflammation is originally seen in the superficial portion of the dentin, that portion just underlying the enamel. All of these writers said that the inflammation and degenerative process was similar to that seen in the inflammation and necrosis of bone.

In 1830 Koecker made one more great step. Although he continues the theory of inflammation, he observes that caries never ex-

poses the pulp without first appearing on the outside of the tooth. There he is coming one step nearer to the theory of the present day. In 1835 Robertson advanced the belief in some sort of a chemical destruction, some sort of an acid which decomposes the food lodged about the teeth. As our predecessors had better methods of investigating this condition they came a little closer to the truth each time a new investigator announced his theories.

In 1838 Regnard, of France, upheld this theory, that an acid causes decomposition, a decry against the inflammatory theory, and one of his strong arguments was the action of decay that had been observed on artificial teeth where the inflammation was impossible. In explanation of this, the artificial teeth of Regnard's time were not porcelain teeth, but those carved from ivory, or those which had been taken from other mouths. He observed that these teeth underwent the same decomposition processes as those naturally in the mouth, and, of course, where a tooth was in that condition there was no chance of any inflammation on the inside of it.

In 1850-59 John Tomes, who was one of the greatest microscopists of his day, discovered with the aid of his instruments that the dentin was composed of tubes. He also discovered that decay apparently began on the outside and progressed toward the center of the tooth. It was he who discovered the "transparent zone," the zone just preceding the action of the caries, which precedes the decomposed portion, and he was in error in believing that it was a wall of resistance thrown up against caries.

In fact, it is one of the first steps in the process by which caries decomposes the tooth structure. He also advanced the theory that it is an external irritant, and that it is something which is sufficient to destroy the vitality and decompose structure.

In 1860 Bridgeman advanced the theory that it is an electric current causing this decomposition. He claimed that the crown was the positive electrode, and that when certain conditions were present an electric current was created which decomposed the enamel of the teeth. His idea illustrated the theory at that time that caries began on the ouside.

Dr. Watt advanced the theory, a rather empirical theory and one worked out by experiments, in which he tried to explain the different colors of decay. He claimed that the different colors were caused by

three acids—nitric acid, sulphuric acid and hydro-chloric acid. He claimed that the acids are generated in the mouth from the action of air and saliva upon the foodstuffs. The nitric acid produces the white decay, and this is generated from the nitrogenous food which we take into the mouth. The sulphuric acid produces black decay, and is generated from the sulphur which is always present with the albumen. The hydro-chloric acid produces the intermediate colors, and is derived from the soluble chlorides which are taken into the mouth. This theory was not worked out by experiment and not much credence was placed on it.

Dr. Magiot, of Paris, advanced one more step and claimed that it is the organic acids and not the mineral acids which create the havoc. The action, according to his theory, would be general, and not local. His theory was one stepping-stone which led to others thinking along the same line and later developed the present theories.

In 1867 Leber and Rottenstein discovered germs in the tubules of the teeth. So here we have the beginning of the germ theory. They called it leptothrix buccalis, but they did not cultivate these germs, and they simply called attention to them, and later we find that there are many germs at work. In 1883-85 the man we all love for what he has done, Dr. Miller, of Berlin, brought forth the "germ theory of decay." He worked for several years before he announced his results, but it was in 1883-85 he announced to the profession that he had found these germs in the teeth, and that he had produced artificial decay exactly like that which appears in the mouth. We are all very well acquainted with this theory, and it is only a waste of time to discuss it. These are the exciting causes as developed up to this time, 1885.

Predisposing causes have been given in Dr. Salisbury's paper. Faulty tooth formation is one of the principal ones; faults in the structure of the tooth or in he shape of the tooth. If we have enamel fissures or occlusal fissures or decayed patches on any of the surfaces of the teeth it is the fault of the tooth formation or structure, and we sometimes find this when the enamel lobes fail to coalesce perfectly, giving malformation, because of the manner of the contact of the teeth. Heredity plays a wonderful role; constitutional conditions, such as pregnancy and the peculiar conditions which will develop in our saliva from time to time, will predispose to caries, and any prolonged illness which lowers our vital resistance will bring sorrow to the teeth as well as the other parts of the body.

In 1905 Miller called attention to the ptyalin theory, which had just been offered for the profession's consideration. These men thought caries was due to some action of the ptyalin of the saliva, but Dr. Miller shows very clearly that it is not that. Some secretions from the mucous glands created the trouble.

In 1905, Dr. Talbot brought the idea that I suggested yesterday in discussing the paper on degeneracy. Possibly some who are here now were not here then, and I might repeat a part of it. According to Dr. Talbot, in the economy of growth the brain of man has been developed along a graded scale, and as man has risen through succeeding steps from the lower animals the brain has been developed at the expense of the other organs, and particularly at the expense of the jaws and teeth. He cites us comparative anatomy. Beginning with the lower types of the animal kingdom, with the reptile, coming up through the various marsupials and up to the shark, the mammals, and up to man, we find that in all of these the snout and the jaws have been receding, consequently there is less room for teeth; fewer can appear. In some of the reptiles we find about seventy-two teeth, in man we find only thirty-two. At the time when man was developed to the stage where he had thirty-two teeth he had his most perfect dental organs. But brain development did not stop there, it has been going on continually, and as the brain has continued to develop the jaws have continued in a degenerative development, with the resultant small jew, fewer teeth can be accommodated, consequently we find some people who do not have third molars, and sometimes they are dropped from the anterior portion of the dental arch instead of from the posterior extremities. He sums up by saying, "Here, then, are the great underlying causes of tooth decay; namely, want of tooth resistance from within, disuse and tooth degeneration along the line of evolution and disease." In one of the last dental journals Dr. Talbot again brings forth the idea that the condition termed *acidosis* and *indicanuria* are predisposing causes to caries, and, according to him these same pathological conditions are some of the exciting causes of abrasion and erosion.

In his treatise he claims that whenever a man has family troubles, or a woman either for that matter, business reverses or too much business to take care of his nerve force is vitiated, thus reducing his physiological resistance, his digestion fails him, his eliminative organs do

not perform their work and acids are left in the body which should be eliminated, the blood becomes abnormally acid in reaction, the saliva is more than normally acid, all of the secretions of the body, external and internal, are slightly acid, and those acids affect such delicate organs as the pulp of the teeth. Here his theory assumes somewhat the character of those old theories of the irritation in the inside of the teeth, beginning at the pulp. From what I read in his article I take it that he believes there is sufficient acid there to begin the decalcification of the dentin from the inside. However, that would not result in caries directly. It is simply a predisposing cause. It makes the attack of caries from the outside much more successful and more rapidly destructive.

There is one other thing that has occurred to me just in the last few days. I heard a week ago, through one man who has a brother afflicted with tuberculosis, of a new cure for tuberculosis. Someone in Chicago has worked out a theory which is quite exceptional to the theories accepted by the medical profession of today. He claims that the tubercle bacillus is, in a way, not an enemy of mankind, that it is equally a benefactor. When we live in cities, dusty, smoky places, we breathe into our lungs much solid substance which our faulty breathing does not expel again. Seventy-five per cent of the people do not use more than one-half of their normal lung power. The lower lobes of the lung are not oxygenated as they should be, and the solid particles breathed in settle in the lower lobes and become an irritation and our faulty breathing does not expel them. The tubercle bacillus steps in and helps nature remove that debris, and if it were not for the tubercle bacilli our lungs would be completely stopped up, and we would die long before we had what now is called tuberculosis. Instead of administering drugs to kill the tubercle bacilli we should administer treatment which will help them do their work, and his treatment is the administration of a serum. It seems to be doing the work. Last May he took seven patients from an institution in Cook county. A month ago the last of the seven patients had been discharged, being sufficiently rid of his tubercle bacilli that if he would take proper pulmonary gymnastics every day he could recover, and probably lead many years of useful life. Of course he does not claim that he restores the lung tissue which has been lost, but he claims that even if they have one-third of their natural quantity they ought

to be able to get along if we get along with one-half of our natural quantity. About three weeks ago one of them felt so well cured that he went and got married. Along the same line I want to say that dental caries is not detrimental to the human race, especially the dentists. If it were not for dental caries probably all of us would be dead long before we are. I do not mean from that that we ought to let our teeth decay and pay no attention to them. But dental caries, or the germs which causes decay, has this function—it is placed there by nature to remove the food debris which lodges around our teeth before it putrefies.

Putrefaction is a process of decomposition which should not take place in the body. Fermentation is a process which may take place and not be detrimental. It is not as bad as putrefaction. When we have putrefaction in the lower bowel it leads to lots of trouble. If we had all of this food debris in the mouth putrefying instead of being removed by caries our system would be constantly poisoned; many ptomaines and other toxins, by-products of putrefaction, would kill us off in pretty short order, but the fact that caries and fermentation remove the food before it has the chance to putrefy prolongs our life. It is pretty well known that the only way to prevent caries is to keep the teeth clean. *Clean teeth never decay;* however, it is absolutely impossible to keep all of the teeth clean all the while.—*Dental Digest.*

EDITORIAL

DENTAL METALLURGY.

A MANUAL FOR THE USE OF DENTAL STUDENGS AND PRACTITIONERS. By Charles J. Essig, M. D., D. D. S., formerly professor of mechanical dentistry and metallurgy in the dental department of the University of Pennsylvania, and Agustus Koenig, B. S., M. D., demonstrator of metallurgy in the dental department of the University of Pennsylvania and formerly assistant demonstrator of histology in the medical and dental departments University of Pennsylvania. Sixth edition, revised and enlarged. Illustrated with 77 engravings. Published by Lea & Fabiger, Philadelphia and New York, 1909.

The sixth edition of this little book comes out with its usual interest, and it will be noted that each edition of this book has been found to be worthy of the name dental metallurgy. It is certainly encouraging to see some one take sufficient interest in this much despised subject in the dental curriculum and come to the rescue of the dental profession in publishing something of the nature of a scientific treatise, whereby dental students can really acquire some scientific knowledge on the subject of metals. This takes in very comprehensively the important chemical and physical properties of one of the most essential phases of the science of materials that the dentist has to use in the prevention of the diseased processes of the teeth and the restoration of lost parts. Anything that will tend to bring dentistry to a higher level of appreciation of the dental profession itself is valuable to the present generation of the profession, and it will be of untold value to the future dentists.

If I were to attempt a criticism on his work, I should say the chapter on amalgam, seems to me, in a large measure, belongs to the chair of operative dentistry. In a work of this kind it seems unnecessary to discuss the bulging and withdrawal of the amalgam from the margins of the cavities of teeth. Let the author give all

that is known regarding the physical and chemical properties of amalgam and let the clinical aspect of the subject go to the realm where it belongs. But the tendency of all writers on dental subjects is to make the work as practical as possible and of course that comes out of the fact that dentists are continually crying for something practical without considering that in every theory there must be something practical. Therefore I am not at all surprised that the author of this little book has been lead away from the science of the subject to the clinical factors that amount to absolutely nothing in the way of science or even to a hypothetical basis for a scientific deduction.

The classification of the material in the book, I think, is very excellently brought out, and it seems to me well adapted for a very excellent book for the teaching of the subject of metallurgy. I think that chapter No. 3, the properties of metals, is one that every dentist should read and study with the greatest of care, and follow that chapter by reading and studying chapter No. 4 on alloys. These two chapters contain the fundamental bases for the construction of crowns and bridges, metallic dentures, and operative dentistry; and a dentist who is not familiar, and thoroughly familiar, with these two important subjects is not worthy of the name of doctor of dental surgery. Perhaps this statement is rather broad, but I consider that these two subjects are of very great importance to the practitioner, and therefore should be well grounded into a student so that he may more fully appreciate his so-called theory when he becomes nothing but an ordinary mechanical dentist. There are but very few mechanical geniuses in dentistry, and therefore it is important to give the average man as much of the fundamental principles that underly the mechanism of the calling of dentistry. So I would advise every practitioner to get this book or some other and familiarize himself with at least some of the text book authorities on the subject. This work impresses me with the thorough manner in which the author has tried to place the subject before the profession.

PERSONAL AND GENERAL

Dies From Extraction.—John Jenkins of South Williamsport, Pa. bled to death following the extraction of several teeth.

Texas Dental College.—The Texas Dental College, located in Houston, Texas. has issued its prospective for the fall term which begins Oct. 5.

Anderson Appointed.—Dr. F. S. Anderson, of Richmond, Ind., was named by Gov. Marshal as a member of the State Board of Dental Examiners.

Whitehurst-Wolford.—Miss Bessie Wolford of Nashville, Tenn. was married to Dr. T. M. Whitehurst a prominent young dentist of Union City Aug. 14.

Make Abstract of Dental Medicine.—A little book, on abstract of dental medicine has been published and dedicated to Dr. G. A. Bellow of Dayton, Ohio.

Cocaine Causes Death.—Alice Arne, a school teacher of Dorset, Ohio, died at her home as the result of heart failure caused by the injection of cocaine.

O'Brien-Henderson.—August 10, Dr. E. W. O'Brien of Point Richmond, Cal. and Miss Alice Henderson of Nevada were married at the home of the latter.

Dentist Faces Charges.—A dentist of Jacksonville Ill. is charged with assault with intent to kill his wife and three children. His wife is at present suing for divorce.

Dentist Arrested.—A dentist of Ft. Smith Ark. has been arrested, charged with failing to file with the state dental board the proper certificate for practicing in that state.

Topeka Dental College.—The Charter Board of the Topeka Dental College met Aug. 14 and organized its faculty and completed its union with the Washburn Medical School.

New York Dentist Arrested.—Upon the complaint of four fellow dentists, a dentist of New York who has been practicing in Watertown, S. D. has been arrested for practicing without a license.

Dentist Marries 5,000.—Up to three years of his death, Aug 7, Dr. Whitslar of Youngstown, Ohio practiced dentistry. He then became a pastor, and in the brief 3 years has married 5,000 couples.

Dental Board Makes Fees.—The state dental board of Oklahoma has received from fees $200 more than has been paid out, which sum is clear profit according to the report of inspector Charles Taylor.

County Dental Society.—The registered dentists of Hancock County, Ohio, met Aug. 13, at the office of one of their members for the purpose of organizing a component society of the Ohio State Dental Society.

Dental Thefts Unsolved.—On account of the lack of evidence, A. S. Johnson, accused twice, as a dental thief has for the second time been released at Rushville, Ind., where he was brought after his arrest, July 26.

Fire.—A bunsen burner was the cause of a serious conflagration in the office of Dr. W. H. Haden of Youngstown, Iowa July 19. Quick work only on the part of the doctor himself saved the contents of the office.

University on Accredited List.—Drake University of Dentistry, Des Moines, Iowa, was placed on the accredited list of Colleges at the annual meeting of the N. A. D. Examiners held at Fortress Munroe, Va., Aug. 2-4, 1909.

Oldest Dentist in U. S. Quits.—After 66 years of continuous practice in dentistry in Westchester, Pa., Dr. Jesse Cope Green, 92 years old retired from practice Aug. 10. Dr. Green is said to be the oldest dentist in this country.

Fire.—July 26, the office and residence of Dr. P. T. Turner at Tracy, Cal., was burned out and his collection of rare books, bric-a-brac and other valuables was destroyed, making a total loss of $200. The origin of the fire is a mystery.

Eighty-four New Massachusetts Dentists.—In the examinations held June 26, 27, and 28, by the Massachussetts Board of Registration eighty-four were successful, a number exceeding by far any previous result. Among these four were women.

Keenan-Fairchild.—Dr. Paul O. Keenan of Beloit, Wis. was married Sept. 1st to Elizabeth Fairchild of the same city. Dr. Keenan is a member of the '06 class of Chicago College of Dental Surgury, Chicago. The American extends congratulations.

Dentist's Auto Stolen.—Early Monday morning, Aug 3, three young men broke into the garage of C. N. Johnson a Chicago dentist and took his car out for a "joy ride." As is usual in such cases the thief had not gone far when because of the reckless speed at which it was being driven the car skidded and striking an obstruction was completely wrecked. The noise of the collision woke the residents for many blocks.

Dentist's Gas Catches Thief.—All Paris is applauding the novel capture of a thief by a well known Paris dentist. The thief entered his office and as the dentist was at that time busy, he asked him to wait. In a mirror, while at work with his patient the dentist saw him rifling his safe. Sending the patient for a policeman he called in the thief who sat down in the chair and by a clever ruse succeeded in administering gas so that he became unconscious enough to be captured.

NECROLOGICAL

Dr. T. D. St. John.—A well known dentist of Gratis, Ohio, died after a very brief illness at the home of his parents, at Miamisburg, July 15, where he had been for about a year. The deceased had practiced up to the time of his illness. He was about 42 years old.

Dr. J. W. Holden, a prominent dentist of Zanesville, O., died Sunday, July 25, after a week's illness, of congestion of the heart. He had been sick for several years and was 56 years of age. He was a resident of Zanesville for many years.

Dr. J. W. Hangawont, one of the pioneer dentists of Fort Dodge, Iowa died, July 18 of a general breakdown. He was well known in the sporting world as an expert with the rifle.

Dr. A. B. Van Sickle, one of the oldest practicing dentists in Iowa died suddenly of heart failure, July 27, at his home at Marshalltown, Iowa. Dr. Van Sickle had moved to Marshalltown fifteen years ago from Fort Dodge, where he had practiced sixteen years.

Dr. E. H. Hollem, a well known dentist of St. Charles, Ill., died July 26, at the home of a sister in Moderia, Colo. His fiancee, Miss Helen Modine was at his death bed. He was a graduate of North Western Dental College, Chicago, Class '05.

Dr. R. J. Washington, a popular young dentist of Guntersville, Ala. died July 22. He was an alumnus of the College of Physicians and Surgeons of Atlanta. He practiced there for a number of years and until recently was the only dentist in the town.

Dr. C. B. Hussey, a dentist, 48 years old, who had lived in Carthage Mo., died July 21 at a local hospital. He was a graduate of the Ohio College of Dental Surgury, class 1888.

Dr. W. W. Richardson, for almost half a century a practicing dentist of New Philadelphia, Ohio, died at his home there in his eighty-third year, July 28.

Dr. A. T. Emery, an old time dentist of Boston died recently at his summer home at Crescent Beach, Me., from paralysis. He retired about ten years ago and was eighty years old. He was an early graduate of the Philadelphia Dental College.

Dr. T. R. Fitzgerald, a prominent dentist of Dorchester, Mass., died July 29 at a hospital in Boston after an extended illness. He was a graduate of the Boston Dental College and the Harvard Medical, class 1898.

Dr. Charles O. Lovitt, a dentist of La Harpe, Ill. died of apendicitis, Aug. 8 at the age of 42 years. He was a graduate of North Western Dental College, class '01.

Dr. Charles H. Evans, a prominent dentist of Yarmouth, Me., 79 years old died Aug. 4, at his home.

Brown Stains on Teeth.—Dr. G. V. Black, who recently went to Colorado Springs in order to study the mysterious brown stains found on the teeth of a great number of the school children has as yet come to no definite conclusion concerning their cause, but denies that the water of the surrounding streams and springs are responsible for it.

Robberies.—Drs. W. H. Lawrence, Mandan, N. D., loss, $40.—S. B. Toney, Mandan, N. D., loss, $100.—M. R. Hopkins, Aberdeen, S. D., loss not given.—Jones, Lawton, Corey, and the New Haven Dental Co., New Haven, Conn., mining stock was taken from the manager of the latter valued at $30,000 the other dentists loosing from $10 to $25 each.—R. D. Snerly, Belleville, Mo., loss not given.—Frank Hanske, Goshen, Ind., loss, $36.—G. E. Menges, Goshen, Ind., loss, $35.—G. E. Harter, Goshen, Ind., loss, $35.—Thomas Johnson and J. E. McRahan, Manson, Wis., loss, $20.—J. S. Goodmanson, Aberdeen, S. D., loss, $45.—E. M. Rogers, Eau Claire, Wis., loss, $200.

Removals.—Drs. Frank Fielding, from Des Moines, Ia., to Indianola, Ia.—J. J. Onthank, from Quincy, Ill., to Toyah, Tex.—A. L. Hamilton, from Findlay, Ohio, to Angleton, Tex.—Emert, from Portsmouth, Ohio, to Findlay, Ohio.—C. A. Whitenack, from Kaukauna, Wis., to Hortonville, Wis.—D. F. S. Regan, from Milwaukee, Wis., to N. Chicago, Ill—F. R. Henshaw, from Middleton, Ind., to Indianapolis, Ind.—Cain, from Indianapolis, Ind., to Middletown, Ind.—W. L. Berryman, from Rockford, Ill., to Amboy, Ill.—J. Seidel, Jr., from New York to Chicago.—Beerman, from Tucumcari to Cimarron, N. M.—F. W. Chandler, from Valley City, N. D., to Fargo, N. D.—Douglas, from Detroit to Dexter, Mich.—N. E. Phelps, from Dexter, Mich., to Coldwater, Mich.—C. S. Mygat, from Madison, Ohio, to Ashtabula, Ohio.—E. Dickinson, from Breckenridge, Tex., to San Benito.—Rice Bros., from Plymouth, Ill., to Macomb, Ill.—O. G. Specht, from Chicago, to Superior, Wis.—E. O. D. Diedricks, from Sibley, Iowa, to Howard, S. D.

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